This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

SPECIFICATION AMENDMENTS

Please insert the following new paragraph on page 5 between lines 22 and 23 of the "Brief Description of the Drawings" section:

FIG. 6A is a flowchart of a method according to an exemplary embodiment of the invention;

Please insert the following new paragraph on page 6 between lines 12 and 13 of the "Brief Description of the Drawings" section:

FIG. 15A is a block diagram of an apparatus of the present invention according to an exemplary embodiment of the invention;

Please insert the following new paragraph on page 7 between lines 7 and 9:

Herein, references to "spider" is short for "spider cursor". In addition, the "cursor object" described herein may also be called the "spider cursor."

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

Please replace the paragraphs on page 29, lines 9-18 with the following paragraphs:

The spider has a low-level application program interface (API) that invokes the ASR 1510. ~~)~~ The Spider API consists of two Component Object Model (COM) interfaces: an ASR interface (IASR) 1530 and the IASRCursor interface 1540. The IASR 1530 is implemented by, and is operably coupled to, the ASR object 1510. The IASRCursor interface 1540 is implemented by one or more ASR cursor objects ~~(not shown)~~ and is operably coupled to the ASR object 1510. This is illustrated at 1545 of system 1505 of Fig. 15A. Multiple active instances of ASR cursor objects are enabled. An ASR cursor is a transient COM object that enables a client 1550 to navigate within the ASR. This is illustrated at 1545 of system 1505 of Fig. 15A. Name, namespace, prefix, type, variable, and operator are all objects.

The IASR 1530 and/or IASRCursor interface 1540 may be considered an apparatus having at least one variable bound to a node or link in the directed labeled graph operably coupled to the annotated schema runtime engine.

Referring to FIG. 15A, system 1505 includes the same components as system 1500 of FIG. 15 except that it includes one or more ASR cursor COM objects 1545.

A client 1550 accesses the spider through an API to the IASR 1530 and the IASRCursor interface 1540, ~~and~~ The client

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

PAGE 12/34 * RCVD AT 6/4/2004 2:24:41 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:509 323 8979 * DURATION (mm-ss):08-44

1550 invokes the methods disclosed in FIGS. ~~5-14~~ 5-7, 10, 12, and 14 and the related discussions herein.

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

PAGE 13/34 * RCVD AT 6/4/2004 2:24:41 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:509 323 8979 * DURATION (mm-ss):08-44

Please replace the paragraph on page 11, lines 14-16 with the following paragraph:

Navigation pattern 300 is an association or a relationship of a "type1" node 310 to a "type2" node 320 and a "type~~3~~5"node 330. More specifically, the "type1" node 310 has relationship3 to "type2" node 320 and has relationship3 to "type~~3~~5"node 330.

Please replace the paragraph on page 12, lines 1-4 with the following paragraph:

In addition, in the creation of spider 400 from pattern 300, a variable 450 is generated to represent "type~~3~~5" node 330 in pattern 300. Node 450 is linked or associated with "type" node 460 containing data "type~~3~~5" and the link or association is defined as a match type, indicating that spider 400 represents a pattern which matches a node of "type~~3~~5" type.

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

PAGE 14/34 * RCVD AT 6/4/2004 2:24:41 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:509 323 8979 * DURATION (mm-ss):08-44

Please replace the paragraph on page 12, lines 16-26 with the following paragraph:

In addition, in the creation of spider 400 from pattern 300, a variable 490 is generated to represent the relationship3 between node 310 and node 330 in pattern 300. Node 490 is linked or associated with "type" node 480 and the link or association is defined as a match type, indicating that spider 400 represents a pattern which matches relationship3. Furthermore, variable 490 is linked, associated or related to variable 410 in the spider with a "source" link, association or relationship to indicate that the source of relationship3 that variable 490 represents in pattern 300 is variable 410 which represents the "type1" node in pattern 300. Also, variable 490 is linked, associated or related to variable 430 in the spider with a "requires" link, association or relationship, and a "destination" link, association or relationship to indicate that the source of the "destination" of the variable 490 is variable 430 which represents the "type~~3~~5" node in pattern 300.

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

PAGE 15/34 * RCVD AT 6/4/2004 2:24:41 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:509 323 8979 * DURATION (mm-ss):08-44

Please insert the following new paragraphs on page 18 between lines 11 and 12:

Referring next to FIG. 6A, a flowchart of a method to be performed by a computer, such as computer 20 in FIG. 1, according to an exemplary embodiment of the invention, is shown. Much of the method shown in FIG. 6A is discussed above as options or alternatives for method 600 of FIG. 6.

At 630, the method retrieves information from the graph.

At 632, it sets the value of a node that a specified variable is bound.

At 634, it begins an atomic transaction.

At 636, it ends the atomic transaction.

At 638, it commits the current atomic transaction.

At 640, the method aborts the current atomic transaction.

At 642, it clones the cursor.

At 644, it enters a snapshot mode.

At 646, it refreshes the snapshot mode.

At 648, the method locks a node.

At 650, it locks a pattern.

At 652, it specifies a level of authorization and access permission in levels of granularity.

At 654, it maps a link and a node to a data source.

421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com
lee&hayes

PAGE 16/34 * RCVD AT 6/4/2004 2:24:41 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:509 323 8979 * DURATION (mm-ss):08-44

At 656, it specifies a variable to receive notification of change. and

At 658, it specifies a pattern to receive notification of change.

Thereafter, the method of FIG. 6A ends.

lee&hayes
421 West Riverside, Suite 500
Spokane, WA 99201
P: 509.324-9256
F: 509.323-8979
www.leehayes.com